后续

CONTINUATION

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SUNDOO®

ADVANCED PRECISION INSTRUMENT

SVM-212 SERIES USER'S MANUAL

SVM-212

使用说明书

数码立体显微镜

DIGITAL STEREO MICROSCOPE

温州山度仪器有限公司

WENZHOU SUNDOO INSTRUMENTS CO., LTD

非常感谢购买SVM-212数码立体显微镜。

SVM-212数码立体显微镜是针对现代制造业的需要，为产品质量检测而研发。运用消杂光大景深技术，并采用优质CCD，能高清晰度成像。有上下两种光源，可在各种作业环境下。视频可直接输出观测，使用观测人员远离直视疲劳和刻度读数。配合配套软件可实现长度、圆径、角度等测量。在一定程度上可替代投影仪、工业显微镜和影像测量仪。普及型价格定位，操作轻松而简单，提高工作效率。

产品广泛运用于电子、弹簧、五金、模具、粉末冶金、精密机械、珠宝饰品、钟表、指纹票证识别、印刷、光纤、手机维修、考古、质量监督、生物、医学、制药、生化研究等领域。

Thank you for your purchasing SVM-212 Stereo Microscope.

SVM-212 Stereo Microscope is researched and designed for quality control of modern manufacture. It can provide high clear image by adopting unique technology of eliminating interferential beam and wide range field, and Hi-quality SONY CCD camera. Moreover the item owns up and down double illumination, and can be used in various environment. The video of microscope can be directly output to view, which helps inspector to avoid optic tiredness and reading from scale. It also realizes measurement of length,radius, angle, etc. In some aspect, the microscope can replace profile projector, industrial microscope and image survey meter with easy operation. This product is widely used in fields of electron, spring, hardware, mould, powder metallurgy, precision instrument, jewellery, clock, fiber, quality control, biology, medicine, biochemical study, and so on.

Packing List

Main body		Quantity
Upper and background illuminations		1
Lens base		1
Flat-field achromatic object lens	16×	1
Flat-fielt ocular	20×	2
Carry object platform		1
CCD Photographic system		1
User's manual		1
Package list		1
Certificate		1

(2) Display + Computer + Video Card + Measuring Software

It can realize micro measuring function by measuring software, which can measure width, radii/diameter, distance between two lines, angle etc.
Connecting Method:
Please insert Video Card into PCI socket of computer, and install Video Card's drive program and measuring program. Then insert one head of AV cable into CCD AV output connector, and connect another head into input connector of Video Card.

(3) Moving Platform

Adding moving platform on work table will make measuring objects moving more smoothly. It attaches a scale with 0.02mm resolution on moving platform.

Maintains

1.When the microscope is not used, please screw ocular protector well, and cover dustproof to prevent dirty, then put in dry place. We advise to stock binocular (trinocular) base and ocular into dampproof container. and place drier to prevent mould.

2.When the microscope is cleaned, don't touch the optical accessories by hands. Please use soft cotton or brush dipped with pure alcohol to clean dirt, obstinate dirt and fingerprint, grease etc.

目录

产品概述……2
外形结构……2
规格参数……4
注意事项……4
操作实例……5
配件选择……7
保养及维修……8
包装清单……8

产品概述

一、功能

SVM-212是连续变倍三目显微镜，他们能够将小物体加以放大并形成正的立体像，被广泛运用于电子工业和细小精密零件的检测、装配、修理、也用于生物解剖和珠宝检验。

SVM-212数码立体显微镜可与摄像装置或彩色显微镜电视装置配套使用。

二、特点

1、SONY高清晰度CCD；

2、超大工作平台；

3、超高工作距离；

4、背光、底光双光源；

5、Video视频输出，选配测量软件实现测量功能。

外形结构

一、原理

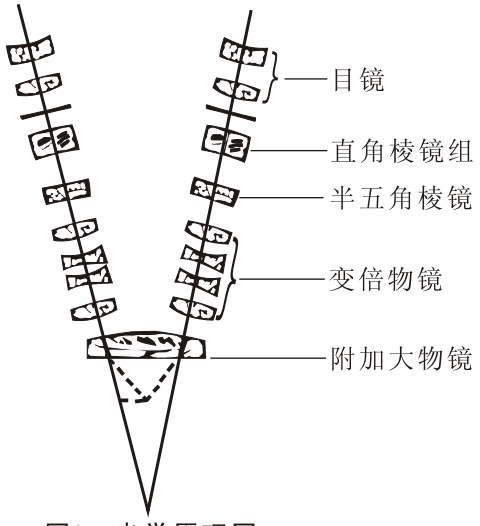


图1、光学原理图

lower magnification can provide wider field of view and depth of scene, which is suitable to find object. We advise to find inspected object by lower magnification at first, then turn Magnification Adjustable Handwheel to get higher magnification for inspecting the details of object.

(4) When magnification is changed from lower to higher, please turning Adjustable Handwheel slightly if the image is little unclear. If image is not clear during changing magnification, please check whether the optic angle is adjusted correctly.

6. Application of Lens Cone

When photography or colorful television is equipped on lens cone, please pull out pull rod of microscope base to make image on the straight cylinder. Loosen fixture screw on straight cylinder, and turn adjustable ring to change length. Then the image in straight cylinder will be same to slant cylinder (it is adjusted well when out of factory).

7. Changing Light Bulb

Please put off the power before changing light bulb. After the lamp is cold, remove Slant Illumination Cover, take off halogen bulb and change it. Opening window on the bottom base can change halogen or fluoresce bulb.

8. Application of Accessorial Ocular

The accessorial ocular is optional to match with microscope if requiring longer working distance or larger magnification. It will have longer working distance by 0.5x and 0.75x, and will own larger magnification by 1.5x and 2x. When using, just screw accessorial ocular into binocular (trinocular) base.

Optional Attachment

(1) AV/VGA, XGA-transfer card + CRT display

The XGA-transfer card can provide hi-definition image of 1024x768x75 Hz, display on CRT without flicker but with bright and flamboyant image.

Connecting Step:

a. Attach the power, connect the CRT's signal connector with the transfer card's connector.

b. Inert matched MMI cable into connector on transfer card, then insert one terminal of AV cable into output connector of CCD camera, and insert another terminal into yellow connector of MMI cable.

Operation

1. Installation

Please take binocular (trinocular) ocular base and main body out of packing box. Lock Fixture Handwheel tightly to prevent Up and Down Pedestal falling down. Please fix the binocular (trinocular) base on main body by fixture screw, and take Lens Protector off.

2. Check Input Voltage

Please check whether voltage of power supply is according with rate input voltage of microscope, which is symbolized on the mark of back or side of the microscope base. If they are identical, put through the power, and the socket must have the earth wire.

3. Select Illumination

Please select slant illumination or transparent illumination according to inspecting requirements. The two illumination mode can be applied simultaneously or separately. The brightness of slant lamp and transparent lamp can be adjusted by Brightness Adjustable Handwheel. If transparent lamp is fluorescent light, the brightness can not be adjusted. The angel of slant illumination is adjustable to ensure enough bright of theinspected sample.

4. Adjust Pupil-gap

Turn Prism Cover to adjust horizontal distance between two oculars according to inspector's pupil gap. When eyes overlap beam through oculars, inspector can see left and right image overlapping.

5. Adjusting Focus

(1) When inspector's sight is normal. Turn Optic Angle Adjustable Ring to zero. If the inspector is hyperopia or short sight, turn Optic Angel Adjustable Ring to corresponding place. For example, if left eye sight is myopia 200 degree, the optic ring should be turned to scale of . If the slight is hyperopia 200 degree, please turn the optic ring to scale of . Up and Down Pedestal Adjustable Handwheel

(2) Adjust focus by turning Adjustable Handwheel, or changing height of Up and Down Pedestal.

(3) Turning Magnification Adjustable Handwheel can provide continuous adjustable magnification. The magnification of object lens is 0.7x-4.5x. The

图1是立体显微镜的光学原理，它由两条完全相同而有一定夹角的光路组成，配有透射光和斜射光照明。通过仪器可观察到放大的正立体像。选购使用附加大物镜可以得到更大的放大倍数或更长的工作距离。SVM-212数码立体显微镜的光学原理基本与上述相同，不同之处在其中一条光路上增加了一反光镜及直角棱镜，使像能成于镜筒上。

二、结构

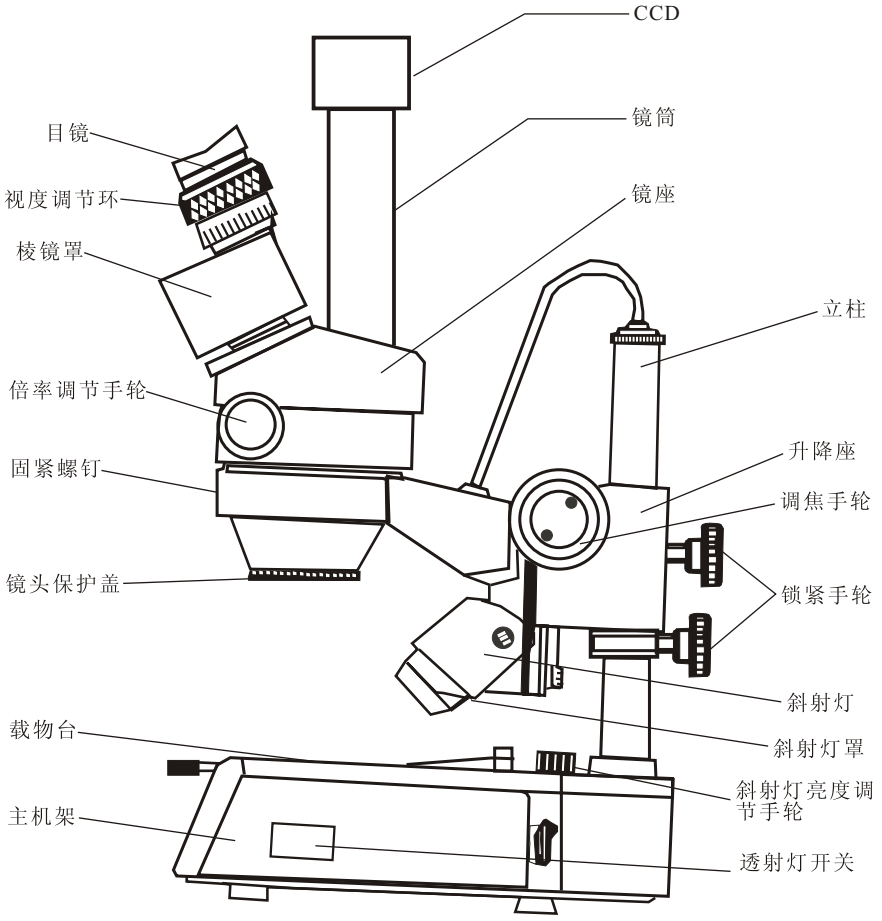


图2、SVM-212结构图

规格参数

型号	SVM-212数码立体显微镜	
成像器件	目视系统	1/3"CCD Sony
放大倍率	15×~90×连续变倍	50×~320×连续变倍
最大倍率对应精度	2μ	2μ
最大倍率对应解析度	0.5μ	0.5μ
最大视场范围	20×20	6.5×4.9
显示方式	目视	监视器、电脑、电视、LCD
照明方式	上、下光源系统	

瞳距调节范围：55~75mm；

手轮调焦范围：60mm；

升降调节范围:110mm；

视度调节范围：±5屈光度；

照明：输入电压：110V或220V；

输出：斜射光照明：12V10W带杯卤素灯；

透射光照明：5W荧光灯。

注意事项

1、切勿拆卸

随便拆卸容易触电及损坏仪器，请不要随便拆卸本说明书所提及的能拆卸的部件之外的任何部件。如果发现仪器有故障，请找有经验的专业维修人员修理，或直接与厂家联系。

2、检查电压

2. Check Voltage

(1)The rate input voltage is signed on the pedestal of microscope. The local power supply must be according with the rate input voltage. Otherwise, please ask the experience specialist to open the cover on the pedestal, turn the switch which has symbol of 110V, 220V, and select the voltage same as the power supply, then fix the cover on the pedestal. It will damage the microscope if it is not operated with rate voltage.

(2)The power socket should have earth cable.

3. Prevent Fire or Scald

(1)The bulb on microscope is in high temperature during lighting. Pay more attention to not touch the bulb to prevent scald.

(2)When changing light bulb, it should be proceeding after bulb is completely cold.

(3)Do not take tinder closing to bulb to avoid fire.

4. Change Light Bulb

(1)Please cut off power before changing bulb to prevent electric shock or damage of equipment.

(2)The microscope only adopts halogen bulb or fluorescent lamp.

(3)Please wear gloves or pack the bulb with cover when changing light bulb, and do not touch the glass of the bulb by hand. After finished, please sweep finger mark and dirty on the bulb with clean cloth dipping in pure alcohol. Otherwise, the bulb will be easy to crack or brightness will be reduced.

5. Carry and Stock

(1)The power must be cut off before moving the microscope.

(2) Operation Environment:

Temperature: 0℃-40℃.

Max Relative Humidity: 85%.

(3)Don't put microscope under sunshine or lamp. bright environment will effect image quailiy.

(4)Don't put microscope in dust environment, and it should be covered by dustproof when not use.

(5)Please put microscope in place without vibration.

Specification

Model	SVM-212 Digital Stereo Microscope	
Image Device	Optic System1	1/3"CCD Sony
Magnification	15×~90×Changing Magnification Continuously	50×~320×Changing Magnification Continuously
Accuracy for Max Magnification	2μ	2μ
Definition for Max Magnification	0.5μ	0.5μ
Max Sight Field(mm)	20×20	6.5×4.9
Display	Eyes Inspect	Monitor, Computer, Television, LCD
Illumination	Upper & Background Illumination System	

Adjustable Range of Pupil-gap: 55~75mm;
Adjusting focus range of handwheel: 60mm;
Adjustable range of fluctuation: 110mm;
Adjustable range of Optic Angel:±5refraction;
Illumination: Input voltage: 110V or 220V;
Output: Slant illumination: 12V 10W halogen bulb;
Transparent illumination: 12V 10W halogen bulb (Provide 5W halogen bulb according to requirements)

Cautions

1. Don't Disassemble Microscope

To reduce the risk of electric shock and equipment damage, please do not remove accessories, which are not described to be removed in the manual. If malfunction, please refer service of professional maintenance man.

①显微镜底座上标有额定输入电压值，注意当地供电电压必须与其相符。否则请找有经验的人员拆开底座，在电源线路板上有一只标有110V、220V的开关，拨动此开关使示值与当地供电电压值相符，然后装好底座。或直接与厂家联系，显微镜在非额定电压条件下使用，将会严重损坏；

②供电插座应有接地线。

3、防烫防火

①在照明期间，灯泡会很烫热，注意不要触及皮肤，以防灼伤；

②更换灯泡应待灯泡充分冷却后进行；

③不要将易燃物质靠近灯泡，以免着火。

4、更换灯泡

①更换灯泡前，必须拔下电源插头，以免触电或损坏仪器；

②只能使用规定规格的卤素灯泡及荧光灯管；

③更换灯泡时，应戴手套或用保护套罩住灯泡，不要用手接触灯泡的玻璃部分。更换后，用洁布蘸上纯酒精擦去灯泡玻璃部分的指纹及污迹，否则灯泡易破裂及减弱亮度。

5、搬运设置

①在搬运显微镜前，要关闭电源开关；

②工作环境要求：

室温：0℃~40℃；

最大相对湿度：85%；

③避免将显微镜置于日光直射之下或房间灯光之下，明亮的环境会影响标本的成像质量；

④避免将显微镜放置有粉尘的环境之中，显微镜不使用时，应用防尘罩盖好；

⑤显微镜应平放在无震动的地方。

操作实例

1、安装

从包装箱中取出镜座和主机架，将主机架上的锁紧手轮拧紧，使

升降座不会下滑。用主机架上的固紧螺钉将镜座固定在主机架上，取下镜头保护盖。

2、输入电压检查

检查底座后面或侧面的电器铭牌指定的输入电压与所用电网电压一致条件下，接通电源，电源插座必须有接地端子。

3、照明的选择

根据观察需要选择斜射照明或透射照明，两种照明可同时使用或单独使用。斜射灯亮度调节手轮调节斜射灯亮度。透射照明是荧光灯没有亮度调节。斜射灯角度可以摆动，以保证充分照明被检样本。

4、瞳距调节

根据观察者两眼瞳距的大小，转动棱镜罩，改变两镜筒之间的水平距离，使观察者双眼与显微镜出射光瞳重合。观察者所看到左右图像重合。

5、调焦

①正常视力的情况下，将左右视度调节环转至零视度。如果视力是远视或近视，则将视度调节环转至相应视度位置。例如：左眼近视200度，应将左边视度环转至“-2”刻度位置，而远视200度则将视度环转至“+2”位置。

②转动调焦手轮或改变升降座的高度均可进行调焦。

③转动倍率调节手轮可获得连续变化的放大倍数。物镜倍率变化由0.7x~4.5x，低倍率有较大的视场和景深。为了便于寻找目标，建议先用较小的倍率观察，找到目标后转动倍率调节手轮。

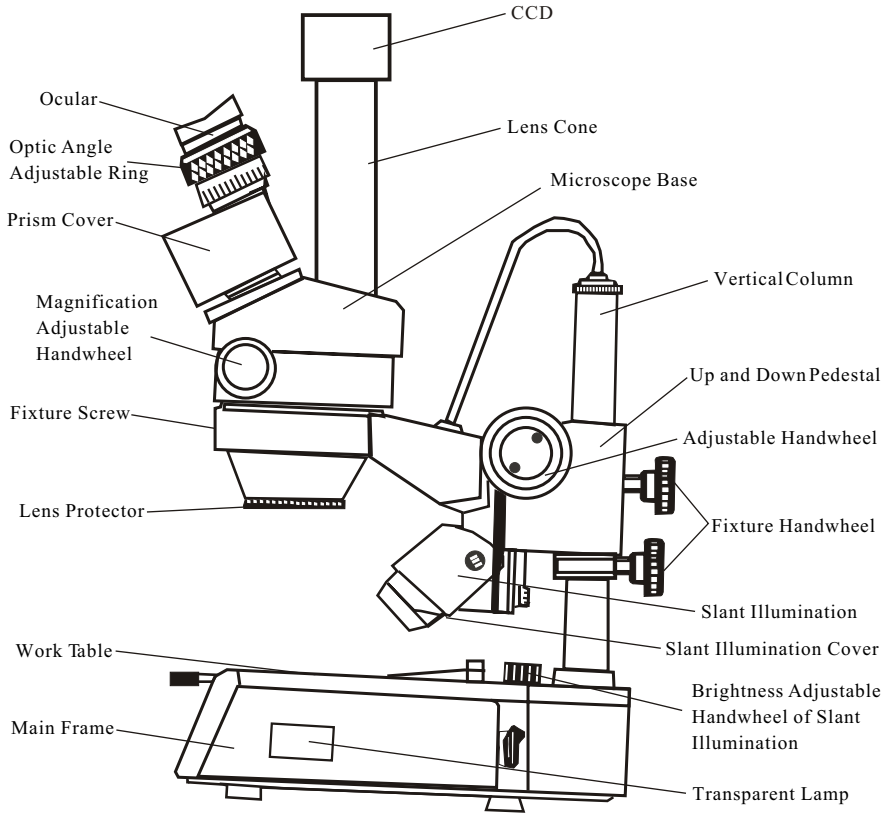
④获得较大的倍率观察目标的细节。当由低倍转至高倍时，图像出现轻微不清晰时，要微量转动调焦手轮。如果变倍过程中图像不清晰，则应检查步骤①视度调节是否正确。

6、镜筒的使用

当需要在镜筒上安装摄影或彩色显微电视装置时，请拉出镜座左边的拉杆，以便将物体成像在镜筒上。松开镜筒上固紧螺钉，转动镜筒调节环，可以改变镜筒的长度，便从镜筒上观察到的图像。

Picture 1 shows the optical theory of stereo microscope. It is composed with two completely identical beam paths, which are in an angel. The upper illumination and transparent illumination are offered with the microscope. The magnified and positive stereo image is inspected through the microscope. By optional purchasing Accessional Object Lens, it can obtain higher magnification or working distance. Most importantly, it has added one viewfinder and right-angle prism to make image on straight cyli

2.Construction



Picture 2 Construction of SVM-212

Summary

1. Function

SVM-212 Digital Stereo Microscope is binocular and trinocular microscope changing magnification continuously. It can zoom the small object, and form stereo image. The microscope is widely used in electric industry, inspection, repair of small precise accessories, jewellery check and biological research. It can be applied with photography equipment or colorful micro-television.

2. Character

(1)SONY CCD with high definition
(2)Large work table
(3)High work distance
(4)Double lamps (background lamp, bottom lamp)
(5)Video output (Realize measuring function by matching measuring software)

Construction

1.Principle

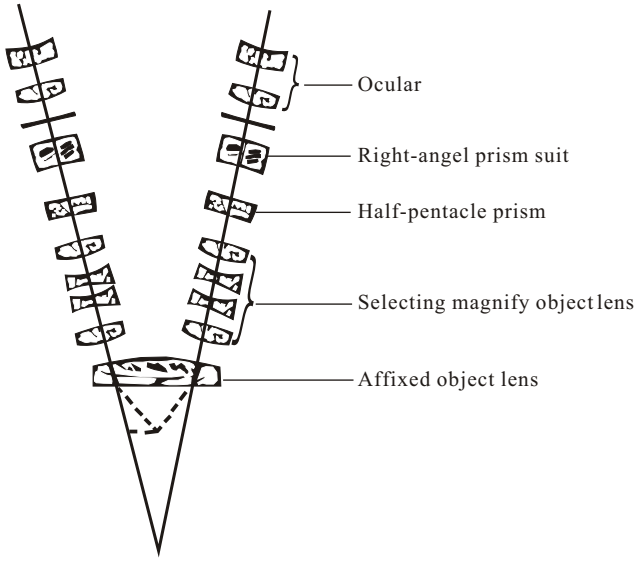


Diagram Object Lens

7、灯泡的更换

更换灯泡前，请拔下电源插头，同时应待灯泡冷却后进行。拧下斜射灯罩，拔出卤素灯即可更换。打开底板上的窗口可更换透射照明的荧光灯。

8、附加大物镜的使用

当需要获得更长的工作距离或更大的放大倍率时，可选用附加大物镜与主机一起使用。0.5x和0.75x有更长的工作距离，1.5x和2x有更大的放大倍率。具体参数见光学性能表，使用时将附加大物镜拧入镜座底部的螺纹即可。

配件选择

1、AV/VGA、XGA转换器+CRT显示器

采用此转换器可获得最高1024x768x75Hz高质量图像，并在CRT上显示，无闪烁，色彩明亮艳丽。

连接方法:

①将转换器电源接通，并将CRT信号线插头和转换器上的母插头连接；

②将转换器配套MMI线插入转换器相应接口，再将AV连接线一头插入摄像头AV输出接口，另一头插入MMI线引出的黄色接口，其它插头空闲。

2、显示器+电脑主机+视频采集卡+测量软件

使用测量软件可获得显微测量功能，可进行宽度、圆半径/直径、线间距，线间角度等测量。

连接方法：

将视频采集卡插在电脑主机PCI插槽上，并安装视频采集卡驱动程序和选配件测量软件。然后在AV连接线一头插入摄像头AV输出接口，另一头插入视频采集卡AV输入口。

3、移动平台

在工作台上增加移动平台，测量时使被测件移动更加平稳，移动平台上附带0.02mm分度的标尺。

保养及维修

1、显微镜不使用时

请拧上镜头保护盖并用防尘罩盖好，贮放在干燥的地方。建议将镜座和目镜保存在防潮容器中，并放干燥剂以免生霉。

2、透镜的清洁

不要用手接触光学零件。最好用柔软的刷子或纱布清除灰尘。比较顽固的污迹和指纹、油脂等，可用干净的软棉布、擦镜纸蘸上无水酒精擦拭。

装箱清单

部件名称		数量
上、下灯源		1
观察镜座		1
平场消色差物镜	16×	1
平场目镜	20×	2
载物板		1
CCD成像系统		1
使用说明书		1
装箱单		1
检验合格证		1

Contents

Summary……10
Construction……10
Specification……12
Cautions……12
Operation……13
Optional Attachment……15
Maintains……16
Packing List……17